

GEOS-5 Presentation to MPWG at EOS-Aura

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GEOS-5 Status

GEOS-5, Version 0.1 (GEOS-5.0.1) has been run for the current duration of the Aura mission

Data flow to user groups is well established, with some reports of unreliability (file corruption)

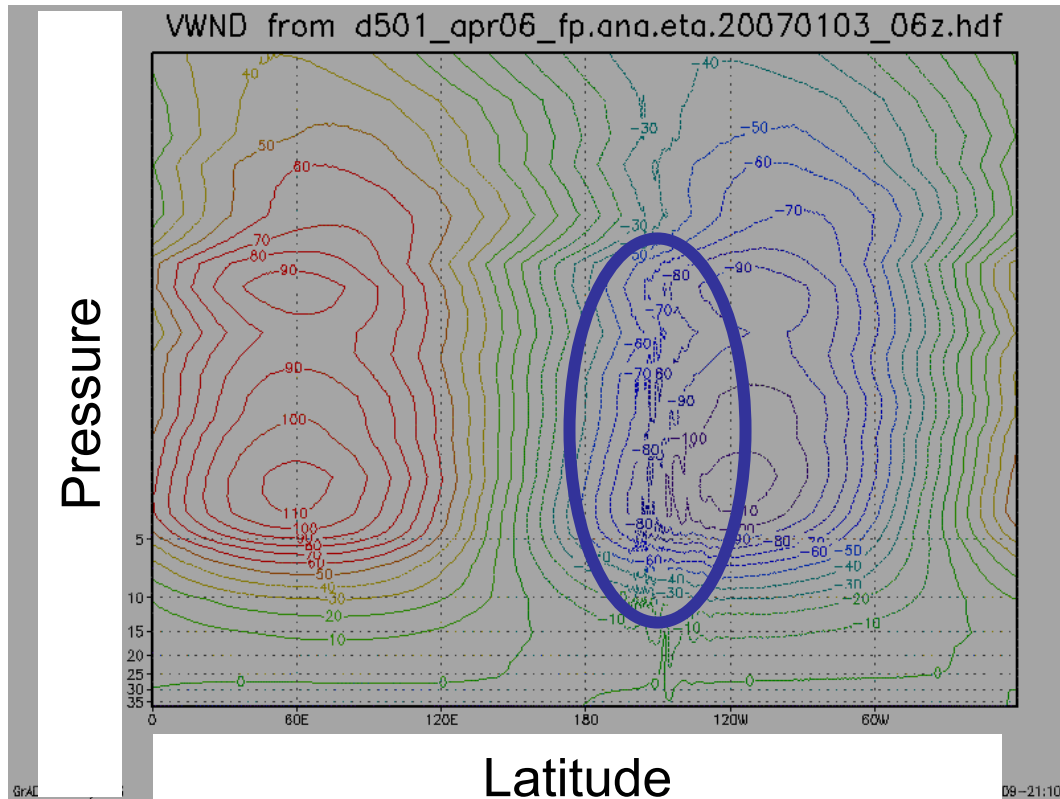
GEOS-5.1.0 is undergoing validation:

- Several bug fixes have been introduced into GCM
- Improvements in some physical processes
- Updates to the analysis capabilities

Sample of some experiments

ExpID	UsrID	Rslv	Date	Control	Tag	
<u>b10p9wgb09</u>	<u>wgu</u>	<u>b72</u>	06/25/2007	<u>b10p9r12ctr</u>	<u>1_5beta10p9</u>	p9RAS12, background error stats_26a + decreasing the unbalance temp error globally.
<u>b10p9wgb08</u>	<u>wgu</u>	<u>b72</u>	06/25/2007	<u>b10p9r12ctr</u>	<u>1_5beta10p9</u>	p9RAS12, background error stats_26a,
<u>b10p9r12ctr</u>	<u>wgu</u>	<u>b72</u>	06/25/2007	<u>b10p9r12ctr</u>	<u>1_5beta10p9</u>	p9RAS12, new background error stats,
<u>b10p9wgb01</u>	<u>wgu</u>	<u>b72</u>	05/21/2007	<u>b10p9ctr</u>	<u>1_5beta10p9</u>	p9_RAS24, new background error stats,
<u>b10p9ctr</u>	<u>wgu</u>	<u>b72</u>	05/21/2007	<u>b10p9ctr</u>	<u>1_5beta10p9</u>	p9_RAS24, b-resolution control run, old background stats
<u>b10p8wgc02</u>	<u>wgu</u>	<u>c72</u>	05/07/2007	<u>b10p8cctr</u>	<u>1_5beta10p8</u>	based on the changes in b10p8wgb37
<u>b10p8cctr</u>	<u>wgu</u>	<u>c72</u>	05/07/2007	<u>b10p8cctr</u>	<u>1_5beta10p8</u>	c-resolution control run
<u>b10p8wgb37</u>	<u>wgu</u>	<u>b72</u>	04/30/2007	<u>b10p8wgb24</u>	<u>1_5beta10p8</u>	based on b10p8wgb24, increasing unbalanced temperature error locally in the tropical region.
<u>b10p8wgb36</u>	<u>wgu</u>	<u>b72</u>	04/23/2007	<u>b10p8wgb24</u>	<u>1_5beta10p8</u>	based on b10p8wgb24, increasing unbalanced temperature error locally in the tropical region.
<u>b10p8wgb24</u>	<u>wgu</u>	<u>b72</u>	04/23/2007	<u>b10p8wgb17</u>	<u>1_5beta10p8</u>	on top of b10p8wgb17, increasing unbalanced temperature error more.
<u>b10p8wgbctr</u>	<u>wgu</u>	<u>b72</u>	04/16/2007	<u>b10p8wgbctr</u>	<u>1_5beta10p8</u>	b-resolution control run
<u>b10p8wgb31</u>	<u>wgu</u>	<u>b72</u>	04/27/2007	<u>b10p8wgb30</u>	<u>1_5beta10p8</u>	on top of b10p8wgb30, increasing the unbalanced temperature std.

Pole Problem in GEOS-5.0.1



Meridional
wind at
 89.5°N

Strong flow over the Pole in January 2007 revealed noise in meridional wind/PV, etc., in GEOS-5.0.1 - this was a problem with the original FV-core (now corrected)

Some other “physical” changes

Updated model error covariance model

All impacts of IR/microwave sounders on ozone are turned off in analysis

Improved parameterization for mesospheric ozone

Substantial changes to parameters in convection code

Bug-fixes (mass conservation) in turbulence and convection codes

Many minor modifications

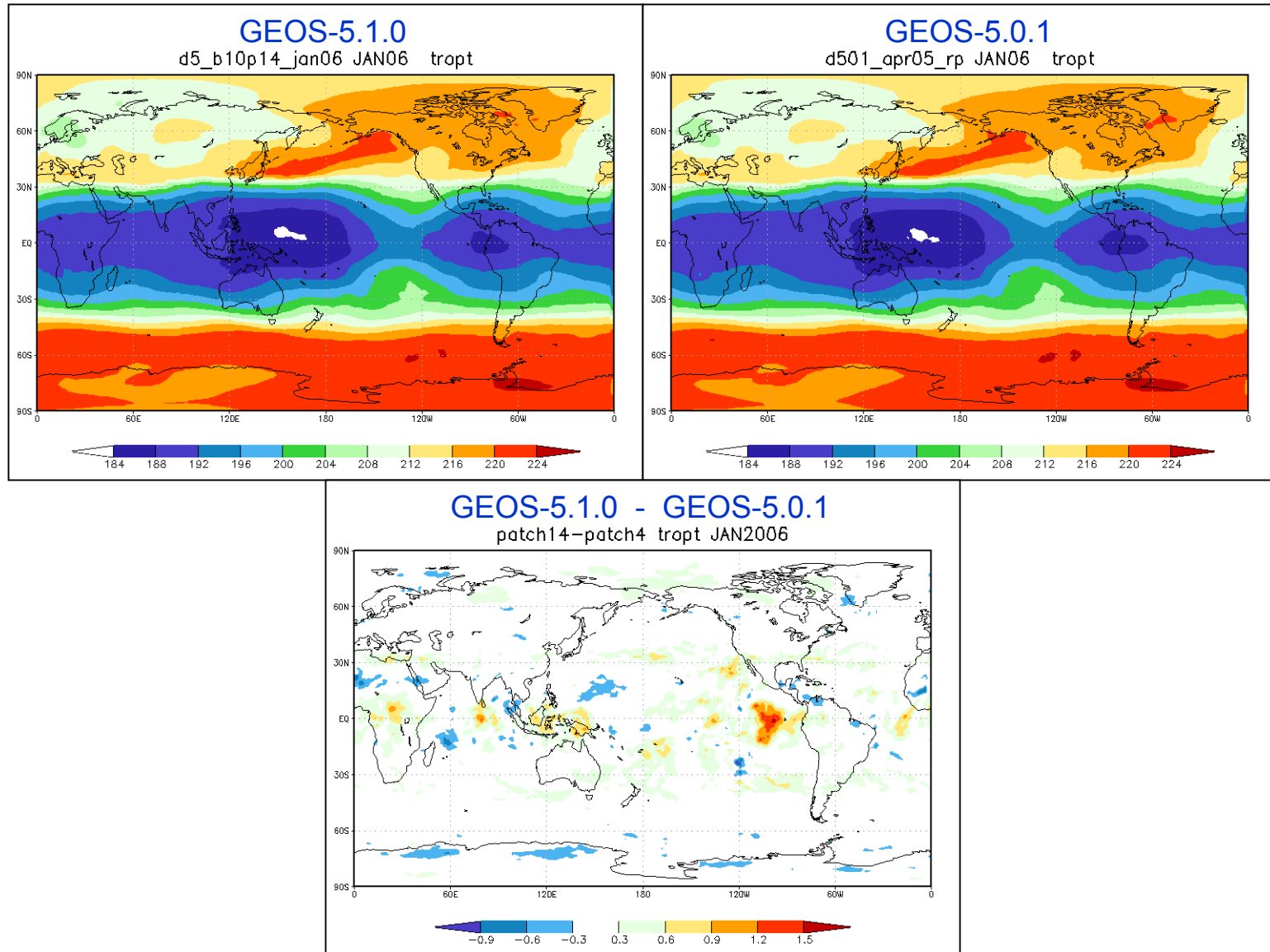
Then the data

Latest output specifications are available on GMAO's web page: <http://gmao.gsfc.nasa.gov/operations>

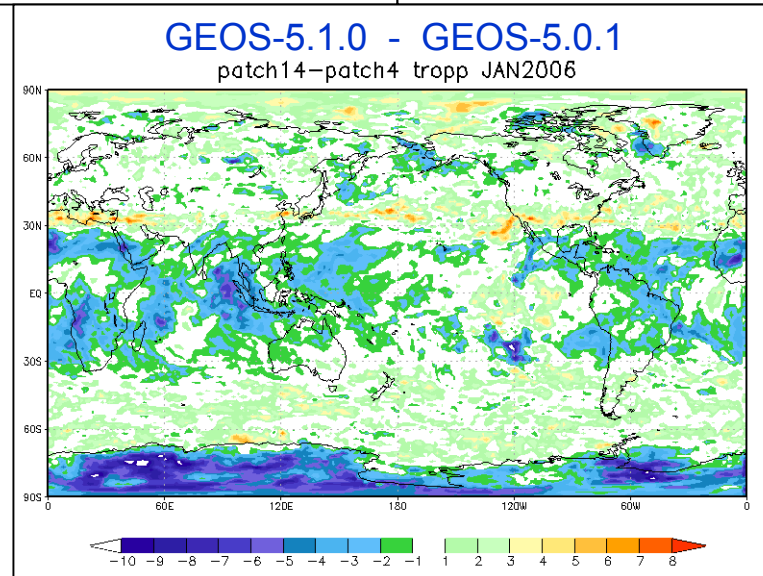
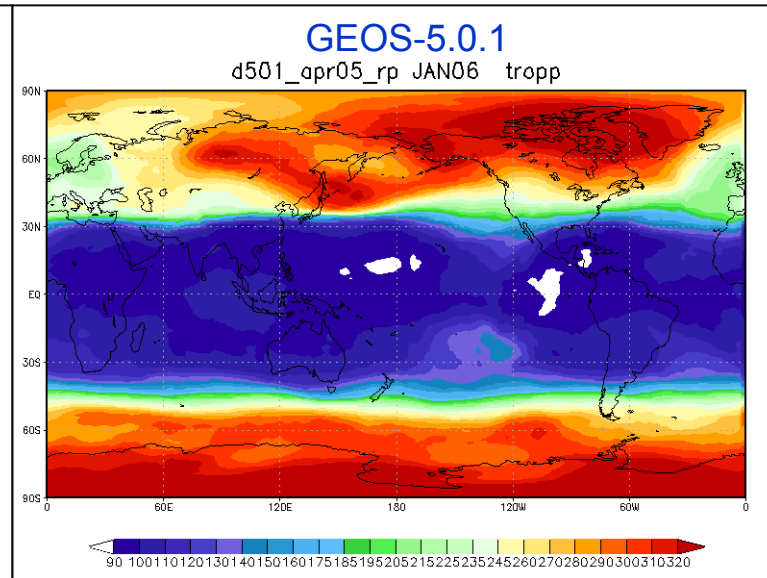
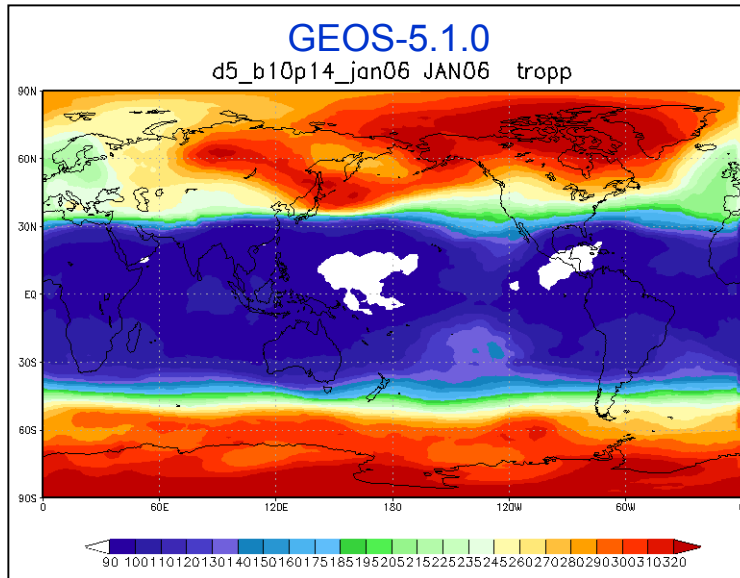
- File content has changed - more stuff (e.g., hourly output of many single-layer variables)
- File format has changed - apparently a good thing!

The half-degree resolution does mean that data volumes are large

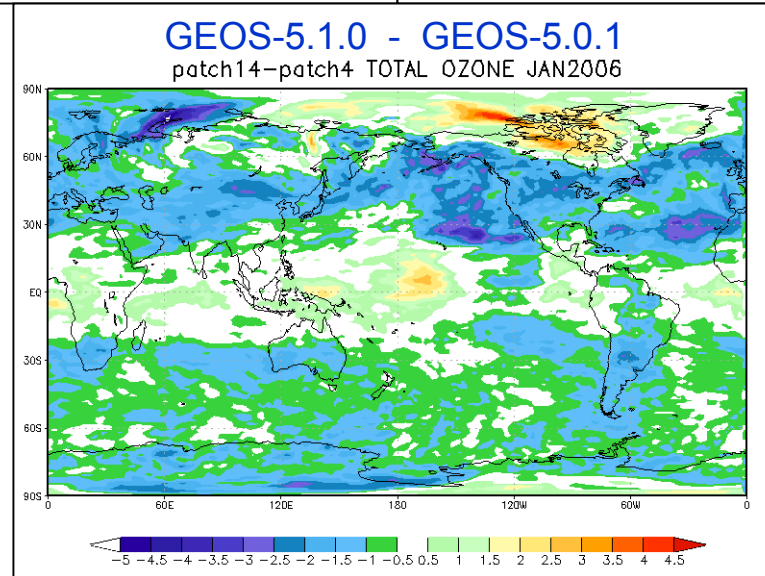
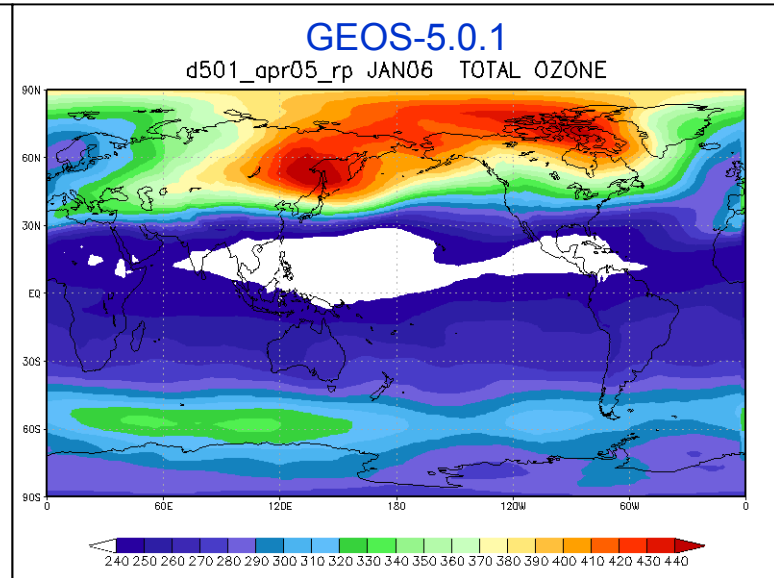
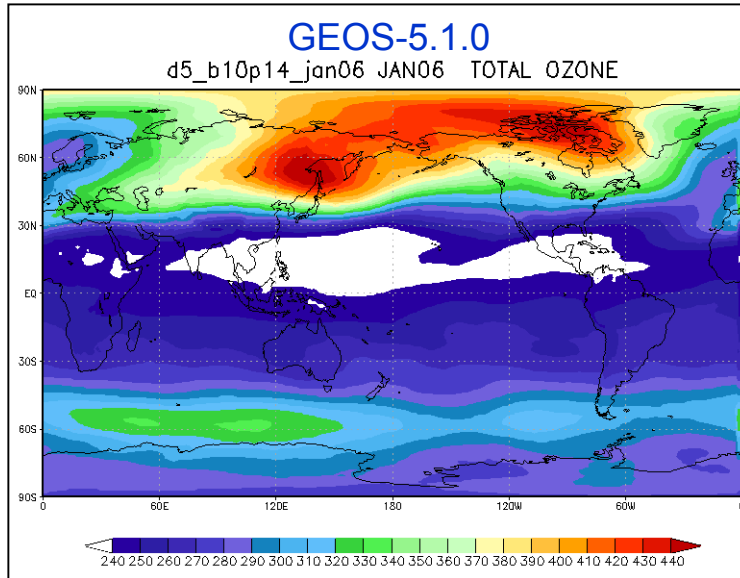
Tropopause Temperature [K]



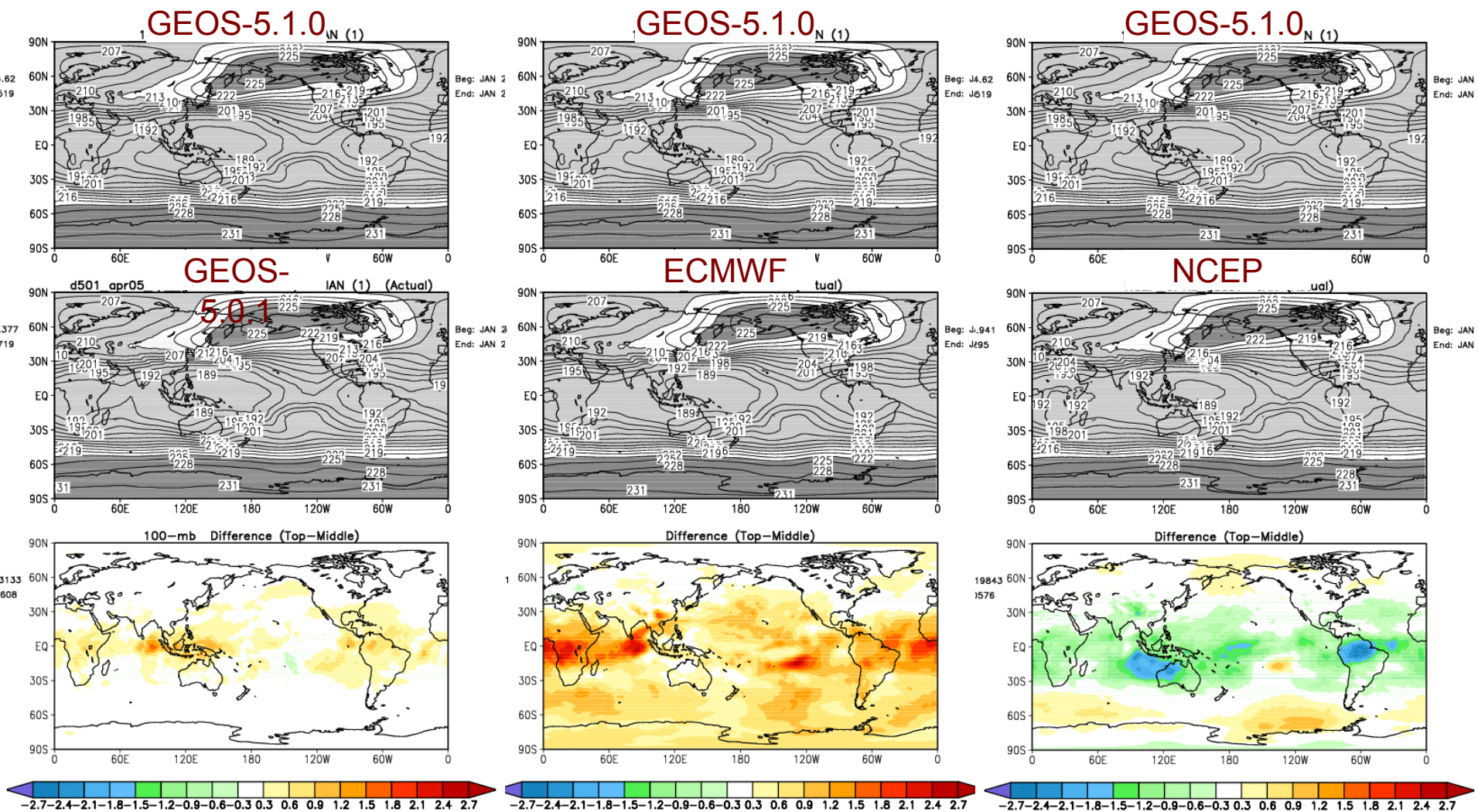
Tropopause Pressure [hPa]



Total Ozone [DU]



100-hPa Temperature [K]

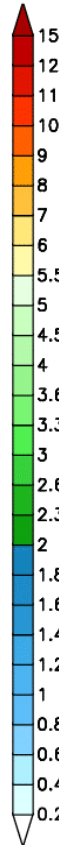
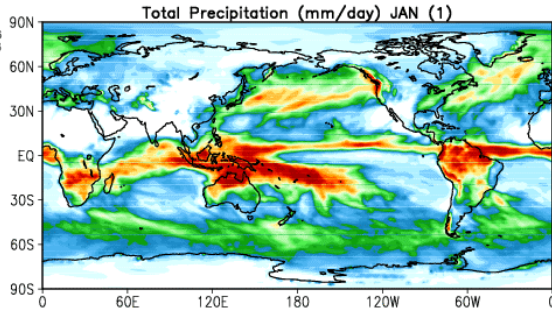


Precip. Compared to GPCP

GEOS-5.1.0

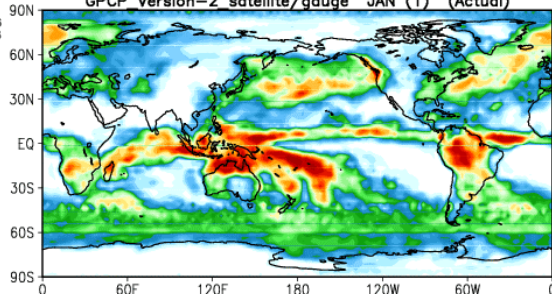
d5_b10p14_jan06

Beg: JAN 2006
End: JAN 2006
Mean: 2.7209
Std: 3.187



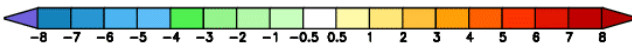
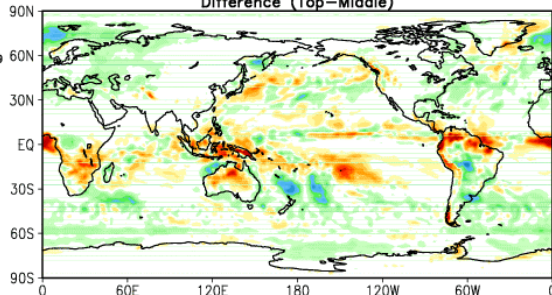
GPCP Version-2 satellite/gauge JAN (1) (Actual)

Beg: JAN 2006
End: JAN 2006
Mean: 2.67969
Std: 2.94184



Difference (Top-Middle)

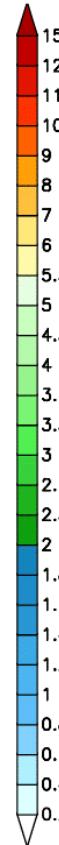
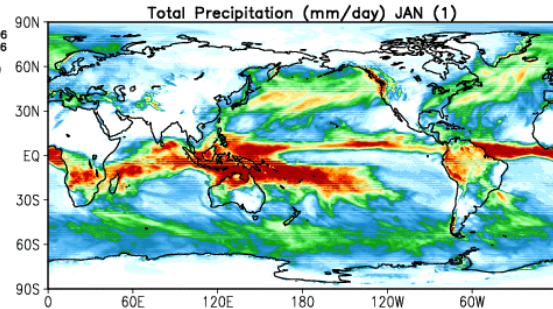
Mean: 0.0412099
Std: 1.43861



GEOS-5.0.1

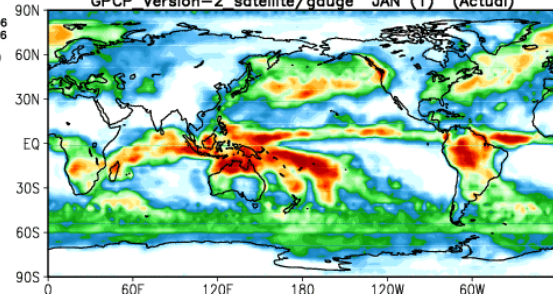
d501_apr05_rp

Beg: JAN 2006
End: JAN 2006
Mean: 2.78189
Std: 3.80799



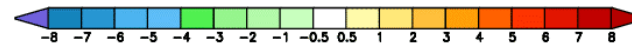
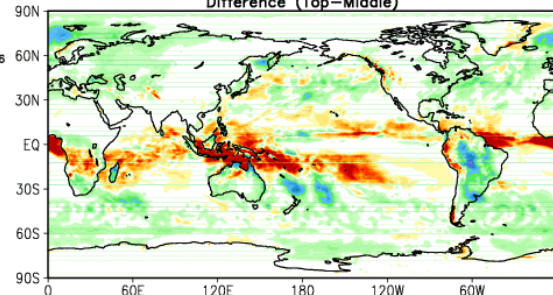
GPCP Version-2 satellite/gauge JAN (1) (Actual)

Beg: JAN 2006
End: JAN 2006
Mean: 2.67969
Std: 2.94184



Difference (Top-Middle)

Mean: 0.102196
Std: 2.19026



GEOS-5

GPCP

Δ

Transition Schedule

GEOS-5.1.0: forward processing begins October 8, 2007

GEOS-5.0.1: forward processing ends - few weeks later

GEOS-5.1.0: Merra (1978-2009) has begun (3 streams)

GEOS-5.1.0: Retro-processing: 10/1/2003 - 10/8/2007,
needs 144 days at 10 processed days per real day

- 2 streams - completed by late April 2008
- 3 streams - completed by late March 2008
- Data-volume issues associated with more than two streams

Discussion Time